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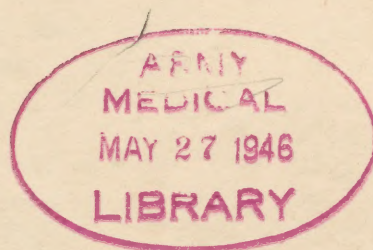
# ARMORED MEDICAL RESEARCH LABORATORY

FORT KNOX, KENTUCKY

INDEXED

Report On

ANTHROPOMETRIC MEASUREMENTS



Project No. 9

INFORMATION COPY

1 February 1943





ARMORED FORCE MEDICAL RESEARCH LABORATORY  
Fort Knox, Kentucky

Project No. 9  
File No. 741-3

February 1, 1943

ANTHROPOMETRIC MEASUREMENTS

1. PROJECT: To Determine Bodily Measurements on Military Personnel.

a. Authority - Letter Commanding General, Headquarters Armored Force, Fort Knox, Kentucky, 400.112/6 GNOHD, dated November 25, 1942.

b. Purpose - The size of various parts of the human body was determined to facilitate the proper design of equipment, particularly Armored Vehicles.

2. DISCUSSION:

a. The Aero-Medical Research Laboratory at Dayton, Ohio, has made available to this Laboratory a considerable amount of data on the size of Air Force Personnel. This data has been used in the design of Air Force equipment.

b. Much of the data supplied by the Air Force is directly applicable to Armored Force personnel if it can be demonstrated that the two populations are similar. Certain standard basic measurements such as height, weight, sitting height, shoulder and hip width, and arm reach were made on a group of 250 Armored Force School soldiers and compared with the much larger Air Corps group. The two groups were found to be essentially alike.

c. The problems of Armored Force vehicular design required that certain measurements be made which were not made on Air Corps personnel. The instruments used for these measurements were in part borrowed from the group at Harvard which measured the Air Corps personnel, and the rest were fabricated with equal accuracy.

d. The additional necessary measurements were made on over 900 Armored Force School soldiers. The data here presented includes all relevant information from both groups of statistics.

e. In the appended data "minimum acceptable range" represents that figure which will include 90% of all military personnel.





3. RESULTS:

a. The more important results are summarized in the following chart and table. Detailed results and a description of each measurement will be found in the appendix.

4. CONCLUSIONS:

a. This material is a sound basis upon which to design Armored Force equipment, particularly such Armored Force vehicles as tanks, in which space requirements are of the greatest importance.

5. RECOMMENDATIONS:

a. This data be supplied to all agencies responsible for the design of army materiel.

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## APPENDIX A

### ANTHROPOMETRIC MEASUREMENTS

#### Techniques of Measurement

Stature. Heels together, toes at 45° angle. Back straight, head in horizontal plane defined by line from trignon (about top of ear hole) to bottom of bony orbit. Measure from front or back, with anthropometer vertical, to vertex (highest point in midline of head)

Total Span. Observer holds anthropometer horizontally, subject pushes movable arm with left hand. Distance between tips of middle fingers. Maximum stretch without straining.

Anterior Arm Reach. Heels together; heels, buttocks, middle of back (in lateral sense), and occiput against wall. Require subject to attain maximum horizontal forward reach, with contacts maintained. Both arms horizontal, extend equally. Distance from wall to tip of right middle finger.

Span-akimbo. Arms flexed, held horizontally, palms down, fingers straight and together; thumbs touching chest; wrists straight. Fingers of each hand do not meet. Anthropometer bar must be horizontal and in contact with back and elbows, the latter being manipulated as required. Measure from behind. Distance between two elbow points. Not necessarily a maximum distance.

Biacromial. Distance between acromial points (external borders of end of scapular (shoulder-blade) spine. Be sure subject is relaxed, but not collapsed. Firm contact.

Bi-deltoid. Arms at side, palms forward. Maximum contact dimension across deltoids (large muscles around shoulders.)

Chest Breadth. Flat portion of anthropometer against chest at nipple level. Use only moderate pressure.

Chest Depth. Horizontal antero-posterior dimension at nipple level. Contact to sternum (breast-bone); fixed arm of anthropometer in spinal groove.

Abdominal Depth. Maximum horizontal contact dimension, wherever found.





Bi-iliac. A firm pressure dimension, maximum iliac brim (across hip-bones). Heels together.

Foot Length. Weight even on both feet. Left foot, maximum contact from heel to great toe (or second, if longer).

Foot Breadth. Weight even on both feet. Left foot, maximum breadth with arms of anthropometer parallel to long axis of leg and foot. Light pressure.

Head Circumference. Maximum of three attempts.

Chest Circumference. Horizontal circumference just above nipples. Do not tighten the tape; merely contact all around. Chest neither expanded nor collapsed; take during quiet breathing.

Calf Circumference. Weight even on both feet. Left calf, maximum horizontal, of three attempts.

Sitting Height. Subject back on table as far as possible, until backs of knees hit table edge. Legs dangle freely. Trunk as erect as possible; head in eye-ear horizontal, as in stature. Measure from rear.

Head Height. Head in horizontal eye-ear plane. Perpendicular height from trignon to mid-longitudinal line on top of head; average of readings for both sides. Trignon is the point where the tragus of the ear terminates superiorly, i.e., the superior corner, toward the head, of the main excavation (concha) of the external ear.

Trunk Height. Trunk in same position as above. Distance from table to topmost margin of bony sternum (breast-bone) palpated. Disregard suprasternal bones. Measure from front.

Buttock-knee. Right side. Trunk erect. Knees together and knee angle at right angle; thighs horizontal. Contact measurement, buttock to skin over patella (knee-cap). (This is thigh length)

Patella Height. Right side. Leg in right angle position. Base of anthropometer near base of heel. Contact to top of muscle mass near end of femur (thigh-bone). A maximum height. (This is knee height)

Bi-epicondylar, femoral. Knees at right angles, feet together, medial epicondyles of femora in firm apposition. Distance between lateral epicondyles (lateral projections of knees).

Bi-trochanteric. Knees together and at right angles, trunk erect. Maximum lateral diameter of buttocks; light touch measurement. Anthropometer horizontal.





Bi-epicondylar elbows. Humeri vertical; arms pushed medially until they touch trunk wall. Hands on sides of thighs, knees together and right-angled, trunk erect. Distance between lateral epicondyles of humeri (outer projections of elbows).

Shoulder-elbow. Trunk erect, humerus vertical, forearm horizontal. Measure from top of acromion process to bottom of elbow.

Squatting Diagonal. Subject on 6 inch seat, feet flat, heels together and touching front of seat; buttocks as far forward on the seat as possible without discomfort or moving heels. Hands placed separately just below patellae. Subject leans forward until humerus is vertical. The dimension lies between tip of left great toe (or second toe, if longer) and the maximum curvature of the cervico-thoracic midline, except in kyphosis (hyper-curvature of upper backbone.)

Hand Length. Right hand, fingers extended and together, palm up. Distance from proximal end of navicular (small wrist bone at base of thumb) to tip of middle finger. Fixed end of caliper firmly pressed against navicular; light contact to finger-tip.

Hand Breadth. Right hand, fingers extended and together, palm up. Arms of caliper parallel to axis of fingers. Distance between radial (lateral) projection of distal end of second metacarpal, and ulnar (medial) projection of distal end of fifth metacarpal. Firm contact.

Shoe Length. Done with shoe on as in foot length.

Shoe Width. Done with shoe on as in foot length.

Eye Height. The distance from the center of the pupil to the top of the head with the subject sitting comfortably and looking straight ahead was measured by having man peer thru a periscope with a 1/8 inch entrance slit. Periscope adjusted to man, head held vertical, and measurement made from center of slit to top of head.

Elbow to Finger Tip. Back against wall. Elbow against wall and parallel to floor. Distance from wall to end of longest finger.

Elbow to Center of Grip. As above holding pencil in center of grip perpendicular to line of forearm, distance from wall to pencil point.

Long and Short Diameters of Shoulder Circumference. Man clothed in combat clothing. A flexible band was put around shoulders at widest point and fitted to man. Shape maintained, instrument transferred to center of graph paper. Exact shape recorded on paper. Shortest and longest diameters measured.

Chest thickness - Stand at attention. Greatest thickness from front to back in thorax.

Chest Width. Arms fully extended above head as far as possible, hands





together; measure greatest width in upper chest region.

Shoulder Height. Sit erect on flat table. Back of knee joint against edge of table. Distance from table to highest bony point in region of acromion.

#### PERCENTILE DISTRIBUTIONS - HOW TO USE THEM

Percentile distributions are offered as the most practical elaboration of statistics for the present purposes. They show what measurement values would accommodate percentages of cadets or gunners from five to ninety-five. By subtraction, per cent of series between any given values can be ascertained. Other percentages may be obtained by interpolation. If a turret dimension is fixed, by reference to the table it can be decided what proportion of cadets or gunners fall within that dimension and can be accommodated by it, or exceed it. The median (50 per cent) is in these series practically equivalent to the arithmetic mean. The total range of measurements is also given. It should be born in mind, however, that the ranges may be unduly extended by cases which represent errors in recording. The most obvious errors have been eliminated, but some less flagrant ones may remain. The percentile distributions are given in the following Tables.





APPENDIX A - Cont'd.

STATURE

Distribution in Percentiles

Stature in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
166.08	65.4	5%
168.00	66.1	10%
169.35	66.7	15%
170.49	67.1	20%
171.48	67.5	25%
172.51	67.9	30%
173.42	68.3	35%
174.22	68.6	40%
174.94	68.8	45%
175.67	69.2	50%
176.48	69.5	55%
177.34	69.8	60%
178.15	70.2	65%
178.97	70.5	70%
179.90	70.8	75%
181.02	71.3	80%
182.20	71.7	85%
183.79	72.4	90%
185.85	73.1	95%

Number: 2961  
 Range: 156-198 (61.4-78.0)  
 Median: 175.67 (69.2)





APPENDIX A - Cont'd.

WEIGHT

Distribution in Percentiles

Weight in Pounds

<u>Weight</u>	<u>Percentiles</u>
128.54	5%
133.81	10%
137.17	15%
139.75	20%
142.13	25%
144.50	30%
146.51	35%
148.65	40%
150.81	45%
153.12	50%
155.27	55%
157.42	60%
159.90	65%
162.37	70%
165.48	75%
168.76	80%
172.74	85%
177.43	90%
184.04	95%

Number: 2960  
 Range: 110-210  
 Median: 153.12



# APPENDIX A - Cont'd.

## SITTING HEIGHT

### Distribution in Percentiles

#### Sitting Height in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
87.60	34.5	5%
88.60	34.9	10%
89.35	35.2	15%
90.01	35.4	20%
90.48	35.6	25%
90.96	35.8	30%
91.38	36.0	35%
91.81	36.1	40%
92.20	36.3	45%
92.55	36.4	50%
92.91	36.5	55%
93.30	36.7	60%
93.71	36.9	65%
94.15	37.0	70%
94.60	37.3	75%
95.20	37.5	80%
95.80	37.7	85%
96.57	38.0	90%
97.70	38.5	95%

Number: 2959  
 Range: 83-103 (32.7-40.6)  
 Median: 92.55 (36.4)





APPENDIX A - Cont'd.

SHOULDER HEIGHT

Distribution in Percentiles

Shoulder Height in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
57.7	22.7	5%
58.7	23.1	10%
59.2	23.3	15%
59.7	23.5	20%
60.5	23.8	25%
61.0	24.0	30%
61.2	24.1	35%
61.5	24.2	40%
62.0	24.4	45%
62.2	24.5	50%
62.5	24.6	55%
62.7	24.7	60%
63.2	24.9	65%
63.5	25.0	70%
64.0	25.2	75%
64.5	25.4	80%
65.0	25.6	85%
66.0	26.0	90%
67.3	26.5	95%

Number: 912  
 Range: 20.2-28.7(51.3-72.9)  
 Median: (50%) 24.5 (62.2)





# APPENDIX A - Cont'd.

## Eye Height

### Distribution in Percentiles

#### Eye Height in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
9.9	3.9	5%
10.2	4.0	10%
10.4	4.1	15%
10.4	4.1	20%
10.7	4.2	25%
10.7	4.2	30%
10.9	4.3	35%
10.9	4.3	40%
11.2	4.4	45%
11.2	4.4	50%
11.4	4.5	55%
11.4	4.5	60%
11.7	4.6	65%
11.7	4.6	70%
11.9	4.7	75%
12.2	4.8	80%
12.2	4.8	85%
12.4	4.9	90%
13.0	5.1	95%

Number: 915  
 Range: 3.4-5.7  
       8.6-14.5  
 Median: (50%) 4.4  
           11.2



# APPENDIX A - Cont'd

## ANTERIOR ARM REACH

### Distribution in Percentiles

#### Anterior Arm Reach in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
83.01	32.7	5%
84.16	33.1	10%
85.15	33.5	15%
85.95	33.8	20%
86.55	34.1	25%
87.14	34.3	30%
87.75	34.5	35%
88.31	34.8	40%
88.83	35.0	45%
89.34	35.2	50%
89.82	35.4	55%
90.34	35.6	60%
90.86	35.8	65%
91.48	36.0	70%
92.14	36.3	75%
92.78	36.5	80%
93.56	36.8	85%
94.54	37.2	90%
95.93	37.8	95%

Number: 2959  
 Range: 75-103 (29.5-40.6)  
 Median: 89.34 (35.2)





Shoulder-Elbow Height

Distribution in Percentiles

Shoulder-Elbow Height in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
34.56	13.6	5%
35.11	13.8	10%
35.57	14.0	15%
35.96	14.2	20%
36.21	14.3	25%
36.44	14.3	30%
36.68	14.4	35%
36.91	14.5	40%
37.13	14.6	45%
37.34	14.7	50%
37.54	14.8	55%
37.72	14.9	60%
37.95	14.9	65%
38.22	15.0	70%
38.51	15.2	75%
38.80	15.3	80%
39.16	15.4	85%
39.53	15.6	90%
40.26	15.8	95%

Number: 2955  
 Range: 27-43 (10.6-16.9)  
 Median: 37.34 (14.7)





# ALABAMA A - Cont'd

## ELBOW TO FINGERTIPS

### Distribution in Percentiles

#### Elbow to Fingertips in Inches

<u>Inches</u>	<u>Percentiles</u>
17-1/2	5%
17-3/4	10%
18	15%
18-1/8	20%
18-1/4	25%
18-3/8	30%
18-1/2	35%
18-5/8	40%
18-3/4	45%
18-3/4	50%
19	55%
19	60%
19-1/4	65%
19-3/8	70%
19-1/2	75%
19-5/8	80%
19-3/4	85%
19-7/8	90%
20-1/2	95%

Number: 101  
 Range: 16-3/4 to 21-7/8  
 Median: (50%) 18-3/4  
 Mean: 18.9



APPENDIX A - Cont'd.

ELBOW TO CENTER OF FIST

Distribution in Percentiles

Elbow to Center of Fist in Inches

<u>Inches</u>	<u>Percentiles</u>
13	5%
13-1/4	10%
13-3/8	15%
13-1/2	20%
13-5/8	25%
13-3/4	30%
13-7/8	35%
13-7/8	40%
14	45%
14-1/8	50%
14-1/4	55%
14-1/4	60%
14-3/8	65%
14-3/8	70%
14-1/2	75%
14-3/4	80%
14-7/8	85%
15-1/8	90%
15-1/2	95%

Number: 101  
 Range: 12-3/8 - 16-3/8  
 Median: (50%) 14-1/8  
 Mean 14.2





HAND LENGTH

Distribution in Percentiles

Hand Length in Millimeters and Inches

<u>mm.</u>	<u>Inches</u>	<u>Percentiles</u>
177.40	7.1	5%
182.43	7.2	10%
184.49	7.3	15%
186.16	7.3	20%
187.48	7.4	25%
188.61	7.4	30%
189.75	7.5	35%
190.82	7.5	40%
191.84	7.6	45%
192.82	7.6	50%
193.85	7.6	55%
194.87	7.7	60%
196.07	7.7	65%
197.18	7.8	70%
198.35	7.8	75%
199.88	7.9	80%
201.52	7.9	85%
203.95	8.0	90%
207.33	8.2	95%

Number: 2952  
 Range: 163-223 (6.4-8.8)  
 Median: 192.82 (7.6)



HAND BREADTH

Distribution in Percentiles

Hand Breadth in Millimeters and Inches

<u>mm.</u>	<u>Inches</u>	<u>Percentiles</u>
79.69	3.1	5%
80.77	3.2	10%
81.71	3.2	15%
82.70	3.3	20%
83.48	3.3	25%
84.02	3.3	30%
84.53	3.3	35%
85.06	3.4	40%
85.60	3.4	45%
86.14	3.4	50%
86.65	3.4	55%
87.17	3.4	60%
87.73	3.5	65%
88.46	3.5	70%
89.09	3.5	75%
89.86	3.5	80%
90.73	3.6	85%
91.51	3.6	90%
93.47	3.7	95%

Number: 2955  
 Range: 73-104 (2.9-4.1)  
 Median: 86.14 (3.4)





BI-DELTOID

Distribution in Percentiles

Bi-Deltoid in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
42.50	16.7	5%
43.21	17.0	10%
43.78	17.2	15%
44.10	17.4	20%
44.40	17.5	25%
44.70	17.6	30%
45.00	17.7	35%
45.24	17.8	40%
45.48	17.9	45%
45.72	18.0	50%
45.96	18.1	55%
46.22	18.2	60%
46.50	18.3	65%
46.77	18.4	70%
47.06	18.5	75%
47.43	18.7	80%
47.79	18.8	85%
48.31	19.0	90%
49.00	19.3	95%

Number: 2955  
 Range: 39-52 (15.4-20.5)  
 Median: 45.72 (18.0)



Table 11

Distribution in Percentiles

Bicrorial in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
36.61	14.4	5%
37.30	14.7	10%
37.76	14.9	15%
38.13	15.0	20%
38.51	15.2	25%
38.77	15.3	30%
39.03	15.4	35%
39.39	15.5	40%
39.54	15.6	45%
39.79	15.7	50%
40.03	15.8	55%
40.28	15.9	60%
40.53	16.0	65%
40.80	16.0	70%
41.07	16.2	75%
41.35	16.3	80%
41.70	16.4	85%
42.15	16.6	90%
42.90	16.9	95%

Number: 2956  
 Range: 32-46 (12.6-18.1)  
 Median: 39.79 (15.7)





SPAN-TOTAL

Distribution in Percentiles

Span-Total in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
170.60	67.2	5%
172.91	68.0	10%
174.44	68.7	15%
175.73	69.2	20%
176.91	69.7	25%
178.00	70.1	30%
178.93	70.5	35%
179.90	70.9	40%
180.73	71.1	45%
181.58	71.5	50%
182.47	71.8	55%
183.42	72.1	60%
184.39	72.6	65%
185.45	73.0	70%
186.61	73.5	75%
187.84	73.9	80%
189.24	74.5	85%
190.97	75.2	90%
193.32	76.1	95%

Number: 2959  
 Range: 158-205 (62.2-80.7)  
 Median: 181.58 (71.5)



APPENDIX A - Cont'd.

SPAN-ARIBBO

Distribution in Percentiles

Span-Arribbo in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
88.14	34.7	5%
89.33	35.1	10%
90.31	35.5	15%
91.14	35.9	20%
91.79	36.1	25%
92.34	36.3	30%
92.84	36.5	35%
93.29	36.7	40%
93.74	36.9	45%
94.22	37.1	50%
94.74	37.3	55%
95.25	37.5	60%
95.75	37.7	65%
96.32	37.9	70%
96.58	38.1	75%
97.72	38.5	80%
98.56	38.8	85%
99.54	39.2	90%
100.95	39.7	95%

Number: 2956  
 Range: 81-108 (31.9-42.5)  
 Median: 94.22 (37.1)





# APPENDIX A - Cont'd

## CHEST THICKNESS

### Distribution in Percentiles

#### Chest Thickness in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
21.8	8.6	5%
22.6	8.9	10%
22.9	9.0	15%
23.1	9.1	20%
23.4	9.2	25%
23.6	9.3	30%
23.9	9.4	35%
24.1	9.5	40%
24.1	9.5	45%
24.4	9.6	50%
24.6	9.7	55%
24.9	9.8	60%
25.1	9.9	65%
25.1	9.9	70%
25.4	10.0	75%
25.9	10.2	80%
26.2	10.3	85%
26.7	10.5	90%
27.4	10.8	95%

Number: 914  
 Range: 7.9-12.3  
       20.1-31.2  
 Median: (50%) 9.6  
           24.4



# ASIA INDIA A - Cont'd

## CHEST WIDTH

### Distribution in Percentiles

#### Chest Width in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
32.7	13.3	5%
34.3	13.5	10%
34.7	13.7	15%
35.3	13.8	20%
35.3	13.9	25%
35.5	14.0	30%
35.7	14.1	35%
36	14.2	40%
36.2	14.3	45%
36.4	14.3	50%
36.7	14.4	55%
36.9	14.5	60%
37.1	14.6	65%
37.3	14.7	70%
37.5	14.8	75%
38.8	14.9	80%
38.1	15.0	85%
38.6	15.2	90%
39.4	15.5	95%

Number: 918  
 Range: 12.5-16.8  
       31.8-42.8  
 Median: (50%) 14.3  
           36.4





CHEST BREADTH

Distribution in Percentiles

Chest Breadth in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
26.23	10.3	5%
26.78	10.5	10%
27.15	10.7	15%
27.40	10.8	20%
27.65	10.9	25%
27.90	11.0	30%
28.12	11.1	35%
28.33	11.2	40%
28.53	11.2	45%
28.75	11.3	50%
28.95	11.4	55%
29.16	11.5	60%
29.34	11.6	65%
29.60	11.7	70%
29.84	11.8	75%
30.14	11.9	80%
30.50	12.0	85%
30.80	12.2	90%
31.54	12.4	95%

Number: 2957  
 Range: 22-34 (8.7-13.4)  
 Median: 28.75 (11.3)



# APPENDIX A - Cont'd.

## CLAST DEPTH

### Distribution in Percentiles

#### Clast Depth in Collectors and Indexes

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
18.25	7.2	5%
18.83	7.4	10%
19.23	7.6	15%
19.51	7.7	20%
19.77	7.8	25%
19.98	7.9	30%
20.19	8.0	35%
20.38	8.0	40%
20.57	8.1	45%
20.76	8.2	50%
20.96	8.3	55%
21.15	8.3	60%
21.38	8.4	65%
21.60	8.5	70%
21.84	8.6	75%
22.14	8.7	80%
22.52	8.9	85%
22.54	9.0	90%
23.64	9.3	95%

Number: 2959  
 Range: 16-28 (6.3-11.0)  
 Median: 20.76 (8.2)



ABDOMINAL LENGTH

Distribution in Percentiles

Abdominal Length in Centimeters and Inches

Cent.	Inches	Percentiles
18.31	7.21	5%
18.54	7.26	10%
18.81	7.37	15%
19.48	7.67	20%
19.74	7.77	25%
19.99	7.87	30%
20.19	7.95	35%
20.39	8.03	40%
20.59	8.12	45%
20.79	8.21	50%
20.99	8.30	55%
21.21	8.39	60%
21.43	8.44	65%
21.65	8.52	70%
21.88	8.62	75%
22.17	8.74	80%
22.56	8.87	85%
22.95	8.95	90%
23.70	9.13	95%

Number: 2958  
 Range: 16-27 (6.3-10.6)  
 Median: 20.77 (8.2)





BUTTOCK-ANALDistribution in PercentilesButtock Anal in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
55.52	22.0	5%
56.01	22.4	10%
57.32	22.6	15%
57.87	22.8	20%
58.25	22.9	25%
58.60	23.1	30%
58.95	23.2	35%
59.28	23.3	40%
59.60	23.5	45%
59.90	23.6	50%
60.25	23.7	55%
60.57	23.8	60%
60.89	24.0	65%
61.28	24.1	70%
61.70	24.3	75%
62.44	24.4	80%
62.66	24.7	85%
63.32	24.9	90%
64.45	25.6	95%

Number: 2954  
 Range: 45-70 (19.3-27.6)  
 Median: 59.93 (23.6)



# APPENDIX A - Cont'd.

## TABLE EIGHT - From Floor

### Distribution in Percentiles

#### Patella Height in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
51.92	20.4	5%
52.72	20.7	10%
53.30	21.0	15%
53.78	21.2	20%
54.19	21.3	25%
54.54	21.5	30%
54.90	21.6	35%
55.21	21.7	40%
55.51	21.8	45%
55.81	22.0	50%
56.11	22.1	55%
56.42	22.2	60%
56.73	22.3	65%
57.05	22.5	70%
57.47	22.6	75%
57.86	22.8	80%
58.39	23.0	85%
58.94	23.2	90%
59.92	23.6	95%

Number: 2959  
 Range: 46-65 (18.1-25.6)  
 Median: 55.81 (22.0)





FOOT LENGTH

Distribution in Percentiles

Foot Length in Millimeters and Inches

<u>Min.</u>	<u>Inches</u>	<u>Percentiles</u>
249.60	9.8	5%
253.63	10.0	10%
256.11	10.1	15%
258.17	10.2	20%
259.73	10.3	25%
261.60	10.4	30%
263.13	10.5	35%
264.61	10.6	40%
265.67	10.7	45%
267.19	10.8	50%
268.52	10.9	55%
269.87	11.0	60%
271.36	11.1	65%
272.98	11.2	70%
275.03	11.3	75%
276.98	11.4	80%
279.32	11.5	85%
282.51	11.6	90%
287.89	11.7	95%

Number: 2959  
 Range: 224-311 (8.8-12.2)  
 Median: 267.19 (10.5)



Table III

Distribution of Percentiles

Port Growth in 1111 Years and Deciles

<u>Port</u>	<u>Deciles</u>	<u>Percentiles</u>
91.11	2.5	5%
92.54	3.3	10%
93.63	3.7	15%
94.57	3.7	20%
95.17	3.7	25%
95.81	3.8	30%
96.47	3.8	35%
97.10	3.8	40%
97.72	3.9	45%
98.34	3.9	50%
98.91	3.9	55%
99.49	3.9	60%
100.11	3.9	65%
100.32	4.0	70%
101.11	4.0	75%
102.57	4.0	80%
103.57	4.1	85%
104.90	4.1	90%
106.63	4.2	95%

Number: 2959  
 Range: 83-118 (3.3-4.6)  
 Median: 98.34 (3.9)



# APPENDIX A - Cont'd.

## Male Adults

### Distribution in Percentiles

#### Shoe Length in Centimeters and Inches

Cent.	Inches	Percentiles
27.9	11.0	5%
28.2	11.1	10%
28.4	11.2	15%
28.7	11.3	20%
29.0	11.4	25%
29.2	11.5	30%
29.2	11.5	35%
29.5	11.6	40%
29.7	11.7	45%
29.7	11.7	50%
30.0	11.8	55%
30.0	11.8	60%
30.2	11.9	65%
30.5	12.0	70%
30.7	12.1	75%
31.0	12.2	80%
31.2	12.3	85%
31.5	12.4	90%
32.0	12.6	95%

Number: 917  
 Range: 10.1-13.5  
       25.7-34.3  
 Median (50%) 11.7  
               29.7





# ANEXA A - Cont'd.

## DIKE LENGTH

### Distribution in Percentiles

#### Eye Height in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
9.9	3.9	5%
10.2	4.0	10%
10.2	4.0	15%
10.4	4.1	20%
10.4	4.1	25%
10.4	4.1	30%
10.4	4.1	35%
10.7	4.2	40%
10.7	4.2	45%
10.7	4.2	50%
10.7	4.2	55%
10.7	4.2	60%
10.7	4.2	65%
10.9	4.3	70%
10.9	4.3	75%
10.9	4.3	80%
10.9	4.3	85%
11.2	4.4	90%
11.2	4.4	95%

Number: 912  
 Range: 3.7-4.6  
       9.4-11.7  
 Median (50%) 4.2  
           10.7



# APPENDIX A - Cont'd.

## HI-TWOCHMIDIC

### Distribution in Percentiles

#### HI-Twochmideric in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
33.21	13.1	5%
33.83	13.3	10%
34.24	13.5	15%
34.54	13.6	20%
34.88	13.7	25%
35.14	13.8	30%
35.36	13.9	35%
35.58	14.0	40%
35.80	14.1	45%
36.03	14.2	50%
36.25	14.3	55%
36.52	14.4	60%
36.81	14.5	65%
37.10	14.6	70%
37.44	14.7	75%
37.70	14.9	80%
38.10	15.0	85%
38.60	15.2	90%
39.41	15.5	95%

Number: 2954  
 Range: 30-47 (11.8-18.9)  
 Median: 36.03 (14.52)





BI-ILIACDistribution in PercentilesBi-Iliac in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
26.43	10.4	5%
27.06	10.7	10%
27.34	10.8	15%
27.63	10.9	20%
27.89	11.0	25%
28.12	11.1	30%
28.31	11.1	35%
28.51	11.2	40%
28.70	11.3	45%
28.89	11.4	50%
29.09	11.4	55%
29.30	11.5	60%
29.51	11.6	65%
29.72	11.7	70%
29.94	11.8	75%
30.20	11.9	80%
30.52	12.0	85%
30.84	12.2	90%
31.44	12.4	95%

Number: 2956  
 Range: 23-34 (9.1-13.4)  
 Median: 28.89 (11.4)



# APPENDIX A - Cont'd.

## BI-EPICONDYLAR - ELBOWS

### Distribution in Percentiles

#### Bi-Epicondylar in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
38.33	15.1	5%
39.25	15.4	10%
39.82	15.7	15%
40.25	15.9	20%
40.71	16.0	25%
41.10	16.2	30%
41.43	16.3	35%
41.77	16.4	40%
42.10	16.6	45%
42.45	16.7	50%
42.78	16.8	55%
43.00	16.9	60%
43.38	17.1	65%
43.70	17.2	70%
44.11	17.4	75%
44.63	17.6	80%
45.16	17.8	85%
45.80	18.0	90%
46.72	18.4	95%

Number: 2955  
 Range: 32-54 (15.6-21.3)  
 Median: 42.40 (16.7)



AFRICA - Cont'd

HEAD CIRCUMFERENCE

Distribution in Percentiles

Head Circumference in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
54.51	21.5	5%
55.13	21.7	10%
55.36	21.8	15%
55.64	21.9	20%
55.88	22.0	25%
56.10	22.1	30%
56.30	22.2	35%
56.53	22.2	40%
56.70	22.3	45%
56.89	22.4	50%
57.08	22.5	55%
57.28	22.6	60%
57.44	22.6	65%
57.66	22.7	70%
57.83	22.8	75%
58.10	22.9	80%
58.42	23.0	85%
58.79	23.2	90%
59.37	23.4	95%

Number: 2955  
 Range: 51-62 (20.1-24.4)  
 Median: 56.65 (22.4)





# APPENDIX A - Continued

## TABLE A.1 - Chest Circumference

### Distribution in Percentile

#### Chest Circumference in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
83.26	32.8	5%
85.27	33.6	10%
86.40	34.0	15%
87.19	34.3	20%
87.92	34.6	25%
88.61	34.9	30%
89.23	35.1	35%
89.80	35.4	40%
90.32	35.6	45%
90.70	35.7	50%
91.43	36.0	55%
92.07	36.3	60%
92.77	36.5	65%
93.53	36.8	70%
94.29	37.1	75%
95.11	37.4	80%
96.10	37.8	85%
97.48	38.4	90%
99.18	39.0	95%

Number: 2954  
 Range: 77-110 (30.7-43.3)  
 Median: 90.70 (35.7)



ADJ. MEAN A - Cont'd.

CALF CIRCUMFERENCE - 1977

Distribution in Percentiles

Calf Circumference in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
32.64	12.8	5%
33.33	13.1	10%
33.83	13.3	15%
34.29	13.5	20%
34.47	13.6	25%
34.80	13.7	30%
35.09	13.8	35%
35.37	13.9	40%
35.65	14.0	45%
35.93	14.1	50%
36.20	14.3	55%
36.50	14.4	60%
36.78	14.5	65%
37.09	14.6	70%
37.44	14.7	75%
37.79	14.9	80%
38.23	15.0	85%
38.79	15.3	90%
39.62	15.6	95%

Number: 2955  
 Range: 28-45 (11.0-17.7)  
 Median: 35.93 (14.1)



# APPENDIX A - Cont'd.

## HEAD HEIGHT

### Distribution in Percentiles

#### Head Height in Millimeters and Inches

<u>mm.</u>	<u>Inches</u>	<u>percentiles</u>
123.29	4.8	5%
125.43	4.9	10%
126.52	5.0	15%
127.56	5.0	20%
128.52	5.1	25%
129.21	5.1	30%
129.98	5.1	35%
130.73	5.2	40%
131.38	5.2	45%
132.22	5.2	50%
133.00	5.2	55%
133.63	5.3	60%
134.47	5.3	65%
135.21	5.3	70%
136.03	5.4	75%
136.95	5.4	80%
138.12	5.4	85%
139.42	5.5	90%
141.55	5.6	95%

Number: 2956  
Range: 110-153 (4.3-6.0)  
Median: 132.22 (5.2)





UPLAND A - Cont'd.

WINDS DIST. WINDS HEIGHT

Distribution in Percentiles

Cm.	Inches	Percentiles
75.09	29.6	5%
75.77	30.0	10%
76.58	30.2	15%
77.27	30.4	20%
77.77	30.6	25%
78.21	30.8	30%
78.62	31.0	35%
79.05	31.1	40%
79.50	31.3	45%
79.76	31.4	50%
80.15	31.5	55%
80.51	31.7	60%
80.89	31.8	65%
81.52	32.0	70%
82.70	32.2	75%
83.90	32.4	80%
85.08	32.6	85%
87.02	34.9	90%
88.74	35.3	95%

Number: 2955  
 Range: 70-90 (27-6-35.4)  
 Median: 79.76 (31.4)



# APPENDIX A - Cont'd.

## TRUNK HEIGHT

### Distribution in Percentiles

#### Trunk Height in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
56.44	22.2	5%
57.32	22.6	10%
57.85	22.8	15%
58.30	23.0	20%
58.72	23.1	25%
59.08	23.3	30%
59.42	23.4	35%
59.73	23.5	40%
60.02	23.6	45%
60.33	23.8	50%
60.64	23.9	55%
60.95	24.0	60%
61.27	24.1	65%
61.63	24.3	70%
62.02	24.4	75%
62.42	24.6	80%
62.92	24.8	85%
63.48	25.0	90%
64.34	25.3	95%

Number: 2957  
 Range: 50-69 (19.7-27.2)  
 Median: 60.33 (23.8)



APPENDIX A - Cont'd.

BI-EPICONDYLAR FEMORAL - Knees

Distribution in Percentiles

Bi-Epicondylar Femoral in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
18.10	7.1	5%
18.34	7.2	10%
18.57	7.3	15%
18.82	7.4	20%
19.03	7.5	25%
19.15	7.5	30%
19.27	7.6	35%
19.39	7.6	40%
19.50	7.7	45%
19.62	7.7	50%
19.74	7.8	55%
19.86	7.8	60%
19.98	7.9	65%
20.16	7.9	70%
20.35	8.0	75%
20.54	8.1	80%
20.73	8.2	85%
20.92	8.2	90%
21.42	8.4	95%

Number: 2955  
 Range: 16-29 (6.3-11.4)  
 Median: 19.62 (7.7)





# APPENDIX A - Cont'd

## SQUATTING DIAGONAL

### Distribution in Percentiles

#### Squatting Diagonal in Centimeters and Inches

<u>Cm.</u>	<u>Inches</u>	<u>Percentiles</u>
78.92	31.1	5%
80.21	31.6	10%
81.05	31.9	15%
81.79	32.2	20%
82.42	32.4	25%
83.00	32.7	30%
83.54	32.9	35%
84.06	33.1	40%
84.50	33.3	45%
84.94	33.4	50%
85.45	33.6	55%
85.96	33.8	60%
86.51	34.0	65%
87.06	34.3	70%
87.59	34.5	75%
88.19	34.7	80%
88.98	35.0	85%
89.87	35.4	90%
91.29	35.9	95%

Number: 2955  
 Range: 71-102 (28.0-40.2)  
 Median: 84.94 (33.4)



